Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183
	)	

REPLY COMMENTS OF INMARSAT, INC.

Inmarsat, Inc. ("Inmarsat") hereby respectfully submits these Reply Comments in the above-captioned proceeding, in which the Commission seeks comment on the feasibility of introducing new terrestrial wireless service in spectrum bands between 3.7 GHz and 24 GHz.[1] Inmarsat concurs with filers identifying the robust usage of this spectrum by critical satellite communications services, particularly in the 3.7-4.2 GHz ("C-Band") band segment, and suggests that further evaluation and deliberation is needed before the Commission sets down a path of making significant changes in this spectrum. Additionally, Inmarsat urges the Commission, as it considers future spectrum needs, to take into account the need to support additional aviation broadband applications.

I. C-BAND PROPOSALS WARRANT FURTHER EVALUATION BEFORE COMMISSION ACTION

Inmarsat is the leader in global mobile satellite communications, operating a system of 14 satellites that provides communications solutions to customers on land, in the air, and at sea using a range of equipment, including handheld satellite phones and notebook-size broadband Internet devices, as well as specialist terminals and antennas fitted to ships, aircraft and road vehicles. Inmarsat's Global Xpress broadband service delivers data speeds of up to 50 Mbps to

[1] *See Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183 (rel. Aug. 3, 2017) (the "NOI").

the most remote and inaccessible locations of the world, and along nearly every point of many long-haul aviation and maritime routes that currently lack high-speed connectivity. Inmarsat recently launched the Inmarsat-S EAN satellite, which will provide multi-beam coverage over Europe as part of the European Aviation Network ("EAN"), a first-of-its kind system combining high capacity satellite coverage with a complementary 4G LTE ground network to provide high-speed passenger Wi-Fi on flights across all European Union states. Inmarsat also operates mobile satellite services supporting critical communications applications requiring up to 99.999% availability. Inmarsat's global system allows customers across the aviation, maritime, enterprise and government sectors to have reliable and assured access to high-throughput communications including voice, mobile broadband, connected car, Internet of Things, smart society, safety-of-life, and emergency communications applications.

Diverse parties have pointed out the varied and critical uses of C-Band satellite services for several industries. As the Satellite Industry Association explained in detail, C-Band satellite services are a key facilitator of video and audio content creation and distribution, essential communications in remote areas of the United States, critical national security and public safety services, emergency communications, and disaster response and restoration.[2] The chorus calling for the Commission to tread carefully with respect to the C-Band is notable in part for its diversity and its unity among otherwise fierce competitors. For example, The Walt Disney Company, CBS Corporation, Scripps Networks Interactive, Inc., Time Warner Inc., 21st Century Fox, Inc., and Viacom Inc. filed jointly as the "Content Companies" to voice concern about proposals for new uses of the C-Band, which they rely upon "to ensure the reliable distribution

[2] Comments of the Satellite Industry Association 6-14, GN Docket No. 17-183 (filed Oct. 2, 2017).

of compelling programming to more than 100 million American television households.[3] Indeed, the importance of C-Band Fixed Satellite Services ("FSS") is so widely recognized, that even parties that are generally bullish on identifying new spectrum resources for terrestrial wireless communications acknowledge the unique case of C-Band.[4]

For its part, Inmarsat also utilizes the C-Band on a daily basis throughout multiple aspects of its business. Inmarsat has C-Band Telemetry, Tracking, and Control ("TT&C") and feeder link functionality on its Inmarsat-3 and Inmarsat-4 satellites, which support critical mobile communications services, including for first responders and the U.S. military. Additionally, C-Band satellite services are utilized by Inmarsat customers. For example, one Inmarsat Government customer uses the band daily, and recently has relied heavily on use of the C-Band to support relief efforts in Texas, Florida, and Puerto Rico.

In light of the critical applications that rely upon C-Band FSS operations, Inmarsat joins filers calling for careful consideration before the Commission takes any action with respect to the C-Band spectrum. There have been several competing proposals offered in this proceeding as to how efficient use of the C-Band might be maximized.[5] While it seems clear that some of these proposals will not offer the protection necessary for the existing critical C-Band FSS operations identified above, others are still being evaluated by industry. Additionally, the Commission

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3 Comments of the Content Companies 1, GN Docket No. 17-183 (filed Oct. 2, 2017).

4 *See, e.g.*, Comments of AT&T Services, Inc. at 5, GN Docket No. 17-183 (filed Oct. 2, 2017) (recognizing that as compared to other frequency bands "the more dynamic nature of the Lower C-Band earth station deployments means that terrestrial sharing is not as straightforward" and that "implementing a workable sharing scheme will be much more complicated . . . .").

5 *See, e.g.*, Comments of the Mid-Band Spectrum Coalition, GN Docket No. 17-183 (filed Oct. 2, 2017); Comments of Dynamic Spectrum Alliance, GN Docket No. 17-183 (filed Oct. 2, 2017); Joint Comments of Intelsat Licensee LLC and Intel Corporation, GN Docket No. 17-183 (filed Oct. 2, 2017).

recently adopted a Notice of Proposed Rulemaking proposing changes to the Citizens Broadband Radio Service ("CBRS") service rules applicable to the 3550-3700MHz band, the results of which may affect the need for additional access to C-Band spectrum by terrestrial operations as well as the overall sharing environment in the band.[6] All of this creates a very complex environment with respect to the C-Band warranting further evaluation before Commission action in this band.

II. THE COMMISSION SHOULD CONSIDER IDENTIFYING ADDITIONAL SPECTRUM FOR AVIATION BROADBAND SERVICES

Inmarsat appreciates the broad evaluation of spectrum bands and potential applications that the Commission has commenced through this NOI. As the Commission proceeds with its forward-looking consideration of evolving spectrum needs, it should take into account the significant growth in demand for in-flight connectivity and aviation broadband services. In recent years, commenters have brought innovative proposals to the Commission regarding potential new frequency bands to be used for air-to-ground communications,[7] and the Commission itself has sought comment on establishing new air-to-ground mobile broadband services.[8]

Individuals increasingly expect seamless connectivity everywhere, including in the skies. Inmarsat's annual Inflight Connectivity Survey, which included more than 9,000 airline

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6 Promoting Investment in the 3550-3700 MHz Band, Notice of Proposed Rulemaking and Order Terminating Petitions, GN Docket No. 17-258 (rel. Oct. 24, 2017).

7 *See, e.g.*, Letter from Brian Russell, Aeronet Global Communications, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 14.177 (filed Oct. 5, 2017).

8 Expanding Access to Broadband and Encouraging Innovation through Establishment of an Air-Ground Mobile Broadband Secondary Service for Passengers Aboard Aircraft in the 14.0-14.5 GHz Band, Notice of Proposed Rulemaking, 28 FCC Rcd 6765 (2013).

passengers from 18 countries, shows that these expectations are only growing.[9] Among the findings of Inmarsat's 2017 survey are that inflight Wi-Fi is now seen as a necessity, not a luxury, that high quality inflight Wi-Fi drives an airline's ticket sales, and that parents find inflight Wi-Fi a "life-saver" when travelling with children.[10] And as the Commission's policies to promote a seamless, high quality 5G ecosystem take hold, consumer demand for a similar broadband experience in the air as on the ground is only going to grow.

Inflight connectivity also is a huge economic opportunity. A recent study by the London School of Economics and Political Science fond that inflight broadband has the potential to create a $130 billion global market within the next 20 years, resulting in $30 billion of additional revenue for airlines by 2035.[11] Inflight connectivity is not just about consumer preference, it is about creating a huge new market segment adding massive value to the global economy. This is particularly true in the United States, where many people travel around the country by air. However, this potential can only be realized if there are sufficient spectrum resources available to support the growth in aviation connectivity. Therefore, as it explores possible uses of mid-band frequencies and others, the Commission should bear in mind the need to identify additional spectrum for air-to-ground mobile broadband services.

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9 Inmarsat, *Inflight Connectivity: Bringing Freedom to the Skies* (July 2017) *available at* https://www.inmarsat.com/wp-content/uploads/2017/08/Inflight-Connectivity-Bringing-Freedom-to-the-Skies_Global-Whitepaper_July-2017.pdf.

10 *Id.*

11 Alexander Grous, London School of Economics and Political Science, *Sky High Economics: Quantifying the commercial opportunities of passenger connectivity for the global airline industry* (September 2017) *available at* http://www.lse.ac.uk/business-and-consultancy/consulting/assets/documents/sky-high-economics-chapter-one.pdf.

Inmarsat appreciates the opportunity to participate in the Commission's wide-ranging evaluation of the potential to increase efficiency and flexibility of use in mid-band spectrum. While there have been many interesting proposals raised on the record in this proceeding, the large number of critical FSS uses of C-Band spectrum and the complexity of the sharing situation in that band indicate that further evaluation is needed before the Commission takes action on the 3.7-4.2 GHz band. However, as the Commission progresses its activities in this proceeding, it should prioritize the identification of additional spectrum to support air-to-ground communications.

Respectfully submitted,

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